

WE CLAIM:

1. A power supply for an electrostatic air filtration unit, comprising:

an input stage that includes an oscillator driven by input power, the oscillator providing an oscillator output voltage;

an output stage that includes an output amplifier for outputting an amplified output voltage on an output electrode at an output of the power supply; and a voltage regulator for inhibiting the output voltage from exceeding a predetermined maximum voltage; and

an isolation stage for de-coupling the input stage from the output stage.
2. A power supply as claimed in claim 1, wherein the power supply is encased in a resin to provide resistance to tampering and environmental damage.
3. A power supply as claimed in claim 1, wherein the output electrode comprises titanium.
4. A power supply as claimed in claim 1, wherein the input stage further comprises an input amplifier that outputs an amplified input voltage to the oscillator, a voltage of the input power being amplified by a predetermined input voltage amplification factor.
5. A power supply as claimed in claim 4, wherein the input amplifier includes a capacitor ladder.

6. A power supply as claimed in claim 1, wherein the isolation stage includes a high voltage isolation transformer.
7. A power supply as claimed in claim 6, wherein the high voltage isolation transformer amplifies the oscillator output voltage by a predetermined isolation stage voltage amplification factor.
8. A power supply as claimed in claim 1, wherein the voltage regulator comprises a voltage clamp.
9. A power supply as claimed in claim 8, wherein the voltage clamp is a diode.
10. A power supply as claimed in claim 1, the power supply further comprises means for bleeding off stored electrostatic charges accumulated on the surface of the output electrode when the power supply is switched off.
11. A power supply as claimed in claim 10, wherein the means for bleeding high voltage has a high impedance.
12. A power supply as claimed in claim 11, wherein the means for bleeding high voltage is a high impedance resistor.
13. A power supply as claimed in claim 1, wherein the power supply further comprises a fault limiting circuit to inhibit damage to the power supply induced by high current flows to the output electrode.

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14. A power supply as claimed in claim 1, wherein the output voltage amplifier comprises a capacitor ladder.
15. A method of manufacturing a power supply for an electrostatic air filtration system, comprising steps of:
 - assembling an input stage that includes an oscillator driven by input power, the oscillator providing an oscillator output voltage;
 - assembling an output stage that includes an output amplifier for outputting an amplified output voltage on an output electrode at an output of the power supply; and a voltage regulator for inhibiting the output voltage from exceeding a predetermined maximum voltage; and
 - interconnecting the input stage and the output stage using an isolation stage to electrically de-couple the input stage from the output stage.
16. The method as claimed in claim 15 further comprising a step of encasing the assembled power supply in an impermeable case in order to inhibit tampering and environmental damage to the power supply.
17. The method as claimed in claim 16 wherein the step of encasing comprises a step of encasing the power supply in a plastic resin that completely encapsulates the power supply.
18. The method as claimed in claim 15 wherein the step of interconnecting comprises a step of using an

isolation transformer to interconnect the input stage and the output stage.

19. A power supply for an electrostatic air filtration unit, comprising:

an input stage that includes a voltage amplifier and an oscillator driven by input power, the oscillator providing an oscillator output voltage;

an output stage that includes an output amplifier for outputting an amplified output voltage on an output electrode at an output of the power supply, a voltage regulator for inhibiting the output voltage from exceeding a predetermined maximum voltage, and a fault limiting circuit for controlling a current drawn from the power supply; and

an isolation transformer for de-coupling the input stage from the output stage.

20. A power supply as claimed in claim 19 wherein the power supply is encased in a plastic resin in order to inhibit tampering and environmental damage caused by the infiltration of water and dust particles.